

# The Genetics of Viruses and Prokaryotes

## 1. Using Prokaryotes and Viruses for Genetic Experiments

## 2. Viruses: Reproduction and Recombination

- A. Scientists studied viruses before they could see them
- B. Viruses reproduce only with the help of living cells
- C. There are many kinds of viruses
- D. Bacteriophages reproduce by either a lytic cycle or a lysogenic cycle
- E. Bacteriophage genes can recombine
- F. Animal viruses have diverse reproductive cycles
- G. Many plant viruses spread with the help of vectors
- H. Viroids are infectious agents consisting entirely of RNA
- I. Prions are be infectious proteins

## 3. Prokaryotes: Reproduction, Mutation, and Recombination

- A. The reproduction of prokaryotes gives rise to clones
- B. Prokaryotic genes mutate
- C. Some bacteria conjugate, recombining their genes
- D. Male bacteria have a fertility plasmid
- E. Genes from the male integrate into the female's chromosome
- F. In transformation, cells pick up genes from their environment
- G. In transduction, viruses carry genes from one cell to another
- H. Resistance factors are plasmids carrying harmful genes
- I. Transposable elements move genes among plasmids and chromosomes

## 4. Regulation of Gene Expression in Prokaryotes

- A. Regulation of transcription conserves energy
- B. Transcriptional regulation uses some familiar tools and some new tools
- C. Operons are units of transcription in prokaryotes
- D. Operator-repressor control that induces transcription: The lac operon
- E. Operator-repressor control that represses transcription: The trp operon
- F. Protein synthesis can be controlled by increasing promoter efficiency